

TREASURY DEPARTMENT



A BRIEF HISTORY

of the

BUREAU OF ENGRAVING AND PRINTING



14th and C Streets, S.W.
Washington, D.C. 20226



VISITING HOURS

The Bureau is open to visitors from
8:00 A.M. to 2:30 P.M. Monday through
Friday except on legal holidays.

BRIEF HISTORY OF THE BUREAU OF ENGRAVING AND PRINTING

The beginning of an establishment for the engraving and printing of United States currency can be traced as far back as August 29, 1862 to a single room in the basement of the main Treasury building where four women and two men began to separate and seal \$1 and \$2 United States notes which had been printed by private bank note companies. These functions were later embodied in what was known as the First Division of the National Currency Bureau. The printing of currency notes by Treasury employees commenced in the fall of 1863 and in 1864 it was recommended to the Secretary of the Treasury that "The Engraving and Printing Bureau of the Treasury Department" be established. The proposal was not accepted at that time, however, and the existence of a printing bureau as a distinct entity within the Treasury Department was not recognized by Congressional legislation until the passage of the Appropriation Act of March 3, 1869. As the years progressed, the "Engraving and Printing Bureau" gradually absorbed the functions performed by the private bank note companies and by October 1, 1877 all United States currency was printed in this bureau.

The century old Bureau of Engraving and Printing has grown from a small unit of six persons to a large, modern industrial establishment, housed in two buildings with a combined floor space of approximately 25 acres and employing about 3000 people.

The Bureau designs, engraves, and prints United States paper currency; Treasury bonds, bills, notes, and certificates of indebtedness; United States postage, customs, revenue, savings stamps, and food coupons; and miscellaneous engraved items for the various departments and independent agencies of the Federal Government, its insular possessions, and the Panama Canal Zone Government. Approximately 800 other miscellaneous products are printed by the Bureau. In addition to work printed from engraved plates, numerous items, including liquor strip stamps, are produced on surface presses from offset plates.

CURRENCY GENERAL

The principal product of the Bureau is United States paper currency. A face value of over \$12 billion is printed annually, averaging approximately 9 million notes a day.

The Bureau prints United States notes and Federal Reserve notes which are distinguishable by their respective titles and the color of the serial numbers and Treasury seals—red is used for the numbers and seals on United States notes and green for Federal Reserve notes.

Over the past century, there have been many classes of currency printed and issued, however, since the small-size

currency was first issued in 1929, all notes of like denomination bear the same portrait of a great American on the face and the same design on the back. This standardization eliminates confusion and is a protection against counterfeiting. They are identified as follows:

Denom.	Portrait	Back
\$ 1	Washington	Obverse and Reverse of Great Seal of U.S.*
\$ 2	Jefferson	Monticello
\$ 5	Lincoln	Lincoln Memorial
\$ 10	Hamilton	U. S. Treasury Building
\$ 20	Jackson	White House
\$ 50	Grant	U. S. Capitol
\$ 100	Franklin	Independence Hall
\$ 500	McKinley	Ornate Five Hundred
\$ 1,000	Cleveland	Ornate One Thousand
\$ 5,000	Madison	Ornate Five Thousand
\$10,000	Chase	Ornate Ten Thousand

*First used in Series 1935
Former Back: Ornate One

While Federal Reserve notes and United States notes are the only classes now being printed, Federal Reserve Bank notes, National Bank notes, Gold Certificates, and Silver Certificates have been printed in the small size in various denominations. Some of the latter are still in public circulation, with the exception of Gold Certificates. Gold Certificates are in use but only circulate between the Federal Reserve banks and the Treasury Department. In addition to the \$100, \$1,000, and \$10,000 denominations described above, there is a \$100,000 gold note with Wilson's portrait. The class of currency to be discontinued most recently is Silver Certificates. Printing has also been suspended on the \$2 United States note and the \$500, \$5,000, and \$10,000 Federal Reserve note.

PLATE MANUFACTURE

To afford the best protection against counterfeiting, all United States paper money, as well as nearly all postage stamps and other evidences of a financial character issued by the United States Government, are printed from plates made from steel engravings. This type of printing is known as intaglio. Of all the printing processes, intaglio is the most difficult to produce and to counterfeit. Other processes lack the fidelity of fine line engraving and the distinctive third dimensional effect of raised line on paper inherent in intaglio printing. Another outstanding element of protection is the portrait. The use of portraits in security design takes full advantage of the characteristics of intaglio printing since even a slight alteration in breadth, spacing, or depth of line on the part of a counterfeiter will cause a perceptible facial change. The portraits used in the designs of

securities are those of persons of historical importance. By law, no portrait of a living person may be used.

In the intaglio-plate manufacturing process the individual features of a chosen design are hand-tooled by highly skilled engravers who carve dots and lines of varying depths into soft pieces of steel with delicate steel-cutting instruments called gravers. With infinite care each feature, such as the portrait, the vignette, the numerals, the lettering, the script, and the scroll work, is hand-engraved by a different master craftsman expertly trained in his own particular skill. The fine crosshatched lines in the background of the portrait are precisely etched from lines ruled in wax on a ruling machine. An unlimited number of intricate lacy patterns for use as borders and ornamentation are deftly cut by means of a geometric lathe. It takes years to acquire the skill of an engraver and it is impossible for him to exactly reproduce his own work, much less that of another engraver. It takes several engravers to prepare the hand-engraved pieces of steel, or dies, as they are called, that are used to make up a master roll or plate.

CURRENCY MANUFACTURE

The Bureau printed all currency by the wet intaglio process on sheet-fed flatbed presses until 1957. As part of an extensive modernization program which has been in progress since 1950, nine high-speed sheet-fed rotary intaglio printing presses, using one plate per press, were procured during the calendar year 1957 and one more in 1964 for printing currency by the dry intaglio process from plates bearing 32 notes (or subjects) to a sheet. These high-speed presses were first used to print one dollar silver certificates, series 1957. Since new dies were adopted and new plates had to be made, these certificates were the first to include in the back design the motto "In God We Trust" in accordance with Public Law 140 of the 84th Congress. Early in 1965, four additional sheet-fed presses having four plates each and capable of printing high-quality 32-subject currency by the dry intaglio process at greatly increased production rates were purchased and placed in operation.

The major components of these high-speed presses include an intaglio plate cylinder, an impression cylinder, an ink fountain, and an automatic sheet-feeding device capable of holding 10,000 sheets in one loading. Each sheet of paper passes between the plate and impression cylinder, under extremely heavy pressure, forcing it down into the fine engraved lines of each plate to pick up the ink. The printed sheets are automatically delivered and deposited one on another in a well-aligned pile.

The backs of the notes are printed with green ink on one day and the faces are printed with black ink on the following day. After the intaglio printing operation, the stacks of 32-subject sheets are trimmed to a uniform dimension. The Treasury

seal, serial numbers, series year, and signatures are then simultaneously overprinted on the face of each of the 32 notes on the sheet by the typographic process on two-color rotary presses.

A Federal Reserve district seal is also overprinted on the face of each Federal Reserve note. The district seal and number, series year, and signatures are always overprinted in black ink. A detailed examination is then made in 16-subject form ($\frac{1}{2}$ of a full-size sheet) and the defective notes marked or identified for subsequent removal. When examined, the sheets are separated into stacks of individual notes on paper cutting machines. After a final note examination—in units of 100 each—for the removal of imperfect notes and the replacement with “star” notes, the currency is securely banded and wrapped for delivery to the vaults of the customer agencies. Each currency package or “brick” contains 40 units of 100 notes each, or 4000 notes, and weighs about $8\frac{1}{2}$ pounds.

In contrast to the wet intaglio process, the dry intaglio process has provided for a relatively high degree of dimensional stability in the paper; it has eliminated shrinkage and distortion and thus has made possible a more uniform reproduction of the original engraving on all currency notes. The life of these notes, in circulation, is much longer than that of notes printed by the wet intaglio process.

STAR NOTES

In the event a finished note is found to be imperfect after it has been overprinted on a typographic press, as described above, it is replaced with a “star” note. In design, star notes are exactly like the notes they replace, but they carry an independent series of serial numbers. The star appears in place of the prefix letter and before the serial number on United States notes and after the serial numbers in place of the suffix letter on Federal Reserve notes. The serial number of the imperfect note which was replaced is not used again in the same numbering sequence. A “star” note is also used for the 100,000,000th note in a series since the numbering machines provide for only eight digits.

MISCELLANEOUS INFORMATION

The cost of producing United States currency is less than 1¢ a note. Two-thirds of the currency notes produced are of the \$1 denomination. The life of the dry-printed \$1 Federal Reserve note averages about 18 months. Other denominations remain in circulation longer. The size of a currency note is 2.61 inches x 6.14 inches and the thickness is .0043 inch. There are 233 new notes to an inch (not compressed) and 490 to a pound. A million notes of any denomination weigh approximately 2000 pounds and occupy approximately 42 cubic feet of space (with moderate pressure). Approximately 4500 tons

of paper and 1200 tons of inks are used each year in producing the Government securities.

POSTAGE STAMP MANUFACTURE

The use of United States postage stamps for the prepayment of delivery fees was first authorized by law on March 3, 1847. In the beginning, these stamps were printed under Government contracts by private bank note engraving firms.

On July 1, 1894, the production of United States postage stamps was transferred from private concerns to the Bureau of Engraving and Printing. Since 1894, the Bureau has been continuously producing postage stamps of the highest quality and security for the Post Office Department. Presently, the Bureau produces and delivers approximately 25 billion postage stamps to over 12,000 separate post offices in the United States. Many millions more are also produced for the Panama Canal Zone.

CLASSES

United States postage stamps are divided into six classes: ordinary, airmail, special delivery, postage due, memorial, and commemorative. They are issued in denominations ranging from ½-cent to \$5. Ordinary postage stamps refer to the regular series of stamps that are kept in constant supply at the post offices. These stamps are often designated by a name; for instance, the "Prominent Americans Series" of 1965 replaced the "Liberty Series" of 1954 which had replaced the "Presidential Series" of 1938. Airmail postage stamps are issued for use on airmail matter only. Memorial stamps honor an American statesman (usually a President) who dies in office. Commemorative stamps honor great people, anniversaries, expositions, and historical events and are issued in limited quantity.

ORIGIN OF DESIGN

Requests for postage stamps, particularly commemoratives, originate with individuals and organizations from all parts of the country. The suggestions are referred to a Citizens' Stamp Advisory Committee, appointed by the Postmaster General for appropriate selection and recommendation to him. Models of the stamp are prepared by the designers in the Bureau of Engraving and Printing and then forwarded to the Postmaster General for final approval. From the approved model the Bureau's skilled engravers inscribe the master die. It takes approximately 125 hours to engrave a stamp. Commemoratives are limited to approximately 15 a year by the Postmaster General.

DRY INTAGLIO PROCESS

United States postage stamps printed in the Bureau are produced primarily or exclusively by the dry intaglio process on web-fed or sheet-fed rotary presses. Portions of some multi-

color stamps are printed by the offset method and then finished on intaglio presses. Stamps printed on the sheet-fed presses are produced on pregummed paper, while the web-fed presses are equipped with an auxiliary mechanism that applies the adhesive to the back of the paper immediately following the printing of the stamps.

SINGLE COLOR STAMPS

Single color stamps are usually printed on six high-speed web-fed rotary intaglio presses. The Bureau developed the basic design for a web-fed rotary intaglio press many years ago. A pilot model web-fed rotary intaglio press of greatly improved design was manufactured by a private contractor in 1950. In 1955, five more web-fed rotary intaglio presses based on the design of the pilot model were manufactured and delivered by a private contractor. These presses are capable of printing single color postage stamps of improved quality three times faster by the dry intaglio process than the older presses which were in use for approximately 45 years for the printing of stamps by the wet intaglio process.

MULTICOLOR STAMPS

Multicolor stamps in sheet form are printed on three high-speed sheet-fed rotary intaglio presses. These presses may also be used to print single color stamps. The Bureau acquired the first three-color press for stamps in 1957, the second in 1959, and the third in 1963. These presses are capable of printing postage stamps in three colors simultaneously from a single plate with only one pass through the press. As many as four or five colors are possible by a system of blending two colors to get a third color.

Postage stamps printed on the single color web-fed presses may be issued in either sheet, book, or coil form and depending on the form, each press plate may contain a complement of either 200, 320, 360, 400, or 432 subjects of the engravings of the stamp to be printed.

SHEET STAMPS

Sheet work is printed from 200- or 400-subject plates, depending on the size of the individual stamp. All classes of postage stamps are produced in sheet form. Sheets of ordinary stamps are printed from 400-subject plates and most commemoratives from 200-subject plates. Sheets of airmail stamps are printed in both sizes. The work is examined for printing, gumming, and perforating defects and then assembled into units of 100 print-size sheets and the units fastened on stitching machines. The stitched units are cut into quarter size (in panes of 50 or 100 stamps), automatically wrapped, and manually boxed for shipment.

BOOK STAMPS

All postage stamps to be processed into books are printed from 320- or 360-subject plates on the single color web-fed presses. The perforated 320- or 360-subject size sheets are first examined for printing, gumming, and perforating defects. After the sheets are trimmed to standard size on cutting machines, they are hand collated with covers, backs, and inserts. The collations are then cut into strips for gluing, stitching, and separating into individual books. The books are cartoned manually, 240 books to the carton for regular issue and 300 books to the carton for vending machines. Cartons are assembled in boxes in various quantities for shipment to post offices. Food coupons and some savings stamps are also manufactured into books.

COIL STAMPS

Approximately thirty-five percent of all postage stamps produced are processed into coil form. After the stamps are printed on the single color web-fed rotary presses from 432-subject plates, they are examined while still in web form for printing, gumming, and other defects on six electronically controlled examining machines. The stamps are then automatically processed on four perforating-coiling machines which perforate and slit the web and coil the stamps into standardized units of 100, 500, and 3000 subjects. Each machine is connected to a complement of automatic wrapping-labeling machines by means of a conveyor system. All operations (winding of coils, conveying, wrapping, sealing, and labeling) are completely automatic. Each stamp coil is wrapped in a cellophane-coated film and labeled; the coils are manually cartoned, sealed, and placed in heavy corrugated boxes in standardized amounts ready for shipment to post offices.

SIGNIFICANT PROGRESS CONTINUES

The Bureau of Engraving and Printing has made significant progress in developing and improving its processes and equipment used in the designing, engraving, and printing of securities and miscellaneous items for the United States Government. Tremendous savings have been realized. In guiding its program of modernization into another century, the Bureau will continue to look for new technological improvements to enhance and safeguard its products—particularly paper currency and postage stamps, which are among the finest in the world.



DIRECTOR